A 70-year-old woman with stenosis at the bifurcation of the left anterior descending artery (LAD) and diagonal branch (Dx) underwent implantation of a Xience Alpine stent (2.5 × 23 mm; Abbott Vascular, Abbott Park, Illinois) in the LAD under 3-dimensional (3D) optical coherence tomography (OCT) (St. Jude Medical, St. Paul, Minnesota) guidance. 3D-OCT image reconstruction using Intage Realia software (Cybernet, Tokyo, Japan) showed the guidewire crossing position and stent link location. The guidewire crossed the distal stent cell between the strut and carina, separated by the link at the middle of the carina (Figure 1A). Previous experience with stent deformation in the distal LAD after kissing balloon inflation (KBI) (Figure 2A) led us to re-cross the guidewire, aiming for the proximal cell. 3D-OCT showed the guidewire passing through the target cell (Figure 1B). A semicompliant balloon (2.0 × 15 mm) was dilated with 4 atm in the proximal LAD (before crossing the stent cell) and pushed toward the Dx to invert the jailed strut at the carina to the Dx side (Online Video 1). The balloon was advanced over the jailed strut, and KBI was performed at 8 atm. The final 3D-OCT imaging revealed excellent stent opening at the Dx orifice (Figure 1C), with the jailed strut inverted toward the Dx and the stent covering the carina like a folding gate (Figure 1D and 1E).

Jailed struts at the side branch orifice and stent deformation are significant factors for restenosis. If the stent link locates at the side branch orifice and the guidewire crosses the distal cell, stent deformation may occur in the distal main vessel after KBI (Figure 2A). If the guidewire crosses the proximal cell, the jailed strut may remain at the carina even after KBI (Figure 2B). Balloon push-fold with proximal cell guidewire crossing may be effective in this situation.

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FIGURE 1 3D Reconstructed Image After Implanting a Xience Alpine Stent

A 3D image was reconstructed after implanting a Xience Alpine stent (2.5 × 23 mm) into the LAD. The stent link was located at the middle of the carina, making it difficult to remove the jailed strut by KBI. (A) The first attempt to cross the GW to the Dx shows the GW crossing into the distal cell. (B) The second attempt shows the GW crossing into the proximal cell. (C) A final 3D image pullback from the LAD shows no jailed strut at the Dx orifice. (D) 3D image pullback from the Dx shows good apposition between the jailed strut inverted toward the Dx at the carina and the inverted strut. (E) “Flythrough” view of the pullback from Dx shows the jailed strut inverted toward the Dx. See Online Video 1.

3D = three-dimensional; Dx = diagonal branch; GW = guide wire; KBI = kissing balloon inflation; LAD = left anterior descending artery.